

Things to Know, Understand and Do

Chapter 3: Stoichiometry

By the end of Chapter 3, you should

know how to...
1. Do calculations that relate the atomic mass of an element and isotopic abundances and masses.
2. Use the molar mass of an element and Avogadro's number in calculations.
3. Calculate the molar mass of compound from its formula and a periodic table.
4. Calculate the number of moles of a compound that is represented by a given mass, or vice versa.
5. Express the composition of a compound in terms of percent composition.
6. Use percent composition or other experimental data to determine the empirical formula of a compound.
7. Determine the molecular formula, given the molar mass of the compound and its empirical formula.
8. Use experimental data to find the number of water molecules in a hydrated compound.
9. Balance a chemical equation.
10. Calculate the mass of one product or reactant using the mass of another reactant or product using a balanced chemical equation.
11. Present stoichiometric data using tables.
12. Determine the limiting reactant and reactant(s) in excess using given amounts of reactants.
13. Determine the theoretical yield of a product using limiting reactant.
14. Determine how much of the reactant of excess is left unreacted.
15. Calculate percent yield of a product.
16. Determine how much of the reactant of excess is left unreacted.
17. Use stoichiometric principles to analyze a mixture.
18. Find the empirical formula of an unknown compound using stoichiometry.
understand...
19. The relative mass scale and the atomic mass unit (amu).
20. That the molar mass of an element is the mass in grams of Avogadro's number of atoms of that element.
21. That the molar mass of a compound (often called its molecular weight) is the mass in grams of Avogadro's number of molecules or formula units of a compound. For ionic compounds, which do not consist of individual molecules, the sum of the atomic masses is often called the formula mass (or formula weight).
22. How mass spectrometry can be used to find a molar mass.
23. All the information conveyed by a balanced chemical equations.
24. The principle of the conservation of mass/matter, which is the basis of stoichiometry.
25. The differences between actual yield, theoretical yield, and percent yield.

Ch 3 HW

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